

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PRODUCT LOCATION METHOD UTILIZING PRODUCT BAR CODE AND AISLE-  
SITUATED, AISLE-IDENTIFYING BAR CODE

Inventor: Kenneth P. Glynn

Assignee: iVoice.com, Inc.

Attorney Docket No. IVC-104A

Kenneth P. Glynn, Esq.  
Attorney for Applicant  
Reg. No. 26,893  
Glynn and Associates  
24 Mine St.  
Flemington, NJ 08822-1731  
tele (908) 788-0077  
fax (908) 788-3999

0070102400KPG-hd

PRODUCT LOCATION METHOD UTILIZING PRODUCT BAR  
CODE AND AISLE-SITUATED, AISLE-IDENTIFYING BAR  
CODE

5

(Attorney Docket No: IVC-104A)

BACKGROUND OF THE INVENTION

1. Field of the Invention

10

15

The present invention relates to item  
locators, i.e. item directories, which direct a  
user such as a consumer or shopper, to a specific  
location to view, retrieve, order, purchase or  
otherwise use the information obtained in the  
system. Such directories may be in list or  
booklet form, in-computer-based form, e. g.  
retrievable or presentable on screen, in print  
out, on-line, voice responsive or otherwise.  
These directories may be stationary, e. g. as a  
posted list; portable, as in a sheet or booklet

form; audible, or in some other form, and may be activated as by some user action, e. g. pressing keys, speaking or otherwise. More specifically,

the present invention includes a physical system

5 and a method of collecting location data for

directories and, in some embodiments, to actually

create directories, which involves the use of

product bar codes and location-situated,

location-identifying bar codes. These are read

10 and matched (coupled) and stored in a processor

to provide location information to directory

managers and subsequent users. Typically, the

present invention could be used at retail stores

to locate items to be purchased. Alternatively,

15 it could be used at a production facility or

distribution facility having a large number of

parts, to locate specific parts for as needed. In other embodiments, it could be used in non-commercial entities, such as public libraries to locate a particular book.

5

## 2. Information Disclosure Statement

10

The state of the art for acquiring product location information involves the use of manually collected, inputted data. Bar codes have been used for years to identify products, but not to identify locations.

15

The following prior art patents represent various inventions relating to machines involving speech recognition for voice-based operation and thus illustrate known voice recognition applications:

U.S. Patent No. 5,111,501 to Masanobu

Shimanuki describes a telephone terminal device  
equipped with a transmitter microphone, a  
receiver, a speech recognition unit that receives  
and recognizes speech signals from the  
transmitter microphone and a circuit to reduce  
the level of signals send from a telephone  
network to the receiver when the speech  
recognition unit receives speech signals from the  
transmitter microphone. Further, this device is  
preferably equipped with a speech reproduction  
unit that reproduces the speech information  
stored in a memory, in response to the  
information of recognition result from the speech  
recognition unit, and a circuit that prevents  
transmission of signals from the telephone  
network to the receiver when the regenerated

speech information is sent to the receiver.

Furthermore, it is desirable for this device to  
be provided with a circuit that prevents  
generation of ringing tones when an incoming call  
arrives.

5

U.S. Patent No. 5,136,634 to David C. Rae et  
al. describes voice operated facsimile machine  
network which includes a method and apparatus for  
transmitting specifically requested graphic  
and/or textual data from an unattended database  
storage location to a requestor's facsimile  
machine over a telephone line which includes a  
host computer such as a PC modified with a  
facsimile transmission board and a voice  
generation board. The host computer receives  
incoming phone calls and prompts the caller using

10

15

the voice board to select data files by using the  
DTMF keys of a standard telephone handset. The  
PC can be left unattended and can run  
automatically in the facsimile transmission mode.

5 Callers can immediately access needed textual and  
image data with the use of just a standard  
telephone and facsimile machine. Multiple  
workstation nodes can be configured in a network  
setup to handle a high volume of calls in real  
10 time and to allow multiple data services to  
operate simultaneously.

U.S. Patent No. 5,165,095 to Mark A.

Borcherding describes a method for dialing a  
telephone, using voice recognition to initiate  
15 the dialing and to determine the correct  
telephone number. The dialing is initiated with

a spoken dial command that is recognized by using speaker independent templates that are stored locally with respect to the caller's telephone.

The correct telephone number is recognized by

5 using speaker dependent template that are downloaded from a central database or by using speaker independent templates stored locally.

U.S. Patent No. 5,168,548 to Steven Kaufman et al. describes a reporting system which is disclosed herein, a speech recognizer which is used to select selections of text from a report form stored in a computer and to insert recognized terms in the text thereby to generate a report text under voice control. A command interpreter, also responsive to spoken words, initiates creation of the report text and its

10

15



subsequent storing, printing and transmission.

The command processor is responsive to respective spoken commands to select a destination telephone number and to cause the report text to be sent to apparatus for converting report text to image data and for modulating an audio band signal with the image data for facsimile transmission over telephone lines.

U.S. Patent No. 5,222,121 to Keiko Shimada describes a voice recognition dialing unit of a telephone mounted on a vehicle or similar mobile body and which allows a call to be originated with ease. When the user of the telephone enters a voice command on voice inputting section, the dialing unit originates a call automatically and thereby connects the other party to the telephone

line. In a call origination procedure, the operations for call origination and the verifications are performed between the user and the unit in an interactive sequence. In a preferred embodiment, the unit has a particular call origination procedure in which, when the other party recognized by the unit is wrong as determined by the user by verification, lower place candidates for the other party are called up in response to a particular voice command. In an alternative embodiment, the unit indicates the other party by voicing a name for verification purpose. The alternative embodiment selects and stores only the name of the other party in response to an entered voice signal and, in the event of response for verification, combines the

name having been stored and response information stored beforehand to produce composite response voice.

U.S. Patent No. 5,231,670 to Richard S.

5

Goldhor et al. describes a system and method for generating text from a voice input that divides the processing of each speech event into a

10

dictation event and a text event. Each dictation event handles the processing of data relating to

the input into the system, and each text event deals with the generation of text from the

inputted voice signals. In order to easily

distinguish the dictation events from each other and text events from each other the system and

15

method creates a data structure for storing

certain information relating to each individual

event. Such data structures enable the system  
and method to process both simple spoken words as  
well as spoken commands and to provide the  
necessary text generation in response to the  
spoken words or to execute an appropriate  
function in response to a command. Speech  
recognition includes the ability to distinguish  
between dictation text and commands.

U.S. Patent No. 5,239,586 to Kuniyoshi Marui  
describes a voice recognition system which  
comprises a handset and a hands-free microphone  
for generating an input audio signal, a high-pass  
filter for eliminating low frequency components  
from the signal from the handset or hands-free  
microphone, a signal level controller for  
adjusting the level of the high-pass signal in

response to the user of either the handset or  
hands-free microphone, a storer for storing the  
speech data and a controller for controlling the  
storer so that a user's utterance is stored or  
5 the user's utterance is recognized by comparing  
the utterance to speech data already stored. The  
handset hook switch provides an on-hook control  
signal to reduce amplifier gain during hands-free  
microphone operation.

10 U.S. Patent No. 5,301,227 to Shoichi Kamei  
et al. describes an automatic dial telephone that  
is useable in a motor vehicle, when a voice input  
is provided during a period in which input of the  
names of called parties is awaited, a voice  
15 pattern of the name of the called party is  
compared with reference patterns of called

parties stored in reference patterns storing  
device, to determine the degree of the similarity  
therebetween. The names of the called parties  
are output to a user in the order of decreasing  
5 degree of similarity. Each time the name of a  
called party is output, a command word for  
confirmation is waited from a user for a  
predetermined time period. When a voice  
confirmation command is input and is recognized  
10 during this waiting period, a telephone number  
corresponding to the name of the called party is  
supplied to a channel. Consequently, the command  
word for confirmation may be input only if the  
name of the called party outputted is one desired  
15 by the user. Sensors continually monitor the  
driving condition of the motor vehicle in which

the telephone is installed. When the operation of the steering wheel or brakes of the motor vehicle exceeds a predetermined threshold or the speed of the motor vehicle is excessive, the sensors generate safety signals that inhibit the operation of the telephone.

U.S. Patent No. 5,335,276 to E. Earle

Thompson et al. describes a communication system which is provided with multiple purpose personal communication devices. Each communication device includes a touch-sensitive visual display to communicate text and graphic information to and from the user and for operating the communication device. Voice activation and voice control capabilities are included within communication devices to perform the same functions as the

touch-sensitive visual display. The  
communication device includes a built-in modem,  
audio input and output, telephone jacks and  
wireless communication. A plurality of  
5 application modules are used with personal  
communication devices to perform a wide variety  
of communication functions such as information  
retrievable, on-line data base services,  
electronic and voice mail. Communication devices  
10 and application modules cooperate to allow  
integrating multiple functions such as real time  
communication, information storage and  
processing, specialized information services, and  
remote control of other equipment into an  
15 intuitively user friendly apparatus. The system  
includes both desktop and hand-held communication



devices with the same full range of communication capabilities provided in each type of communication device.

U.S. Patent No. 5,349,636 to Roberto

5       Irribarren describes a communication system for verbal telephonic communication which has a voice message system for storing and retrieving voice messages integrated with a computer database accessing system for storing and retrieving text  
10       messages from a separate computer system and for converting the text messages into voice. The systems are integrated via a network which coordinates the functions of each individual  
15       system. Additionally, the input/output ports of the voice message system and the computer database accessing system are connected in a

parallel fashion to at least one telephone line.

In this configuration a user may access both

voice messages and database information,

including text or electronic mail messages, with

5 a single telephone call. Optionally, facsimile

messages can be stored, retrieved and manipulated

with a single telephone call.

U.S. Patent No. 5,406,618 to Stephen B.

Knuth et al. describes a telephone answering

10 device that is activated by a proximity sensor

when a user crosses its field of detection and

whose operation is controlled by simple voice

commands. The device incorporates speaker-

independent voice recognition circuitry to

15 respond to spoken commands of the user that are

elicited by a system generated voice request

menu. The telephone answering device performs all the basic functions of a telephone answering machine in response to these simple commands and there is no need for the user to manually operate the telephone answering device.

5

U.S. Patent No. 5,602,963 to W. Michael Bissonnette et al. describes a small, portable, hand-held electronic personal organizer which performs voice recognition on words spoken by a user to input data into the organizer and records voice messages from the user. The spoken words and the voice messages are input via a microphone. The voice messages are compressed before being converted into digital signals for storage. The stored digital voice messages are reconverted into analog signals and then expanded

10

15

for reproduction using a speaker. The organizer  
is capable of a number of different functions,  
including voice training, memo record, reminder,  
manual reminder, timer setting, message review,  
5 waiting message, calendar, phone group select,  
number retrieval, add phone number, security and  
"no" logic. During such various functions, data  
is principally entered by voice and occasionally  
through use of a limited keypad, and voice  
10 recordings are made and played back as  
appropriate. A visual display provides feedback  
to the user. During the various function, the  
user can edit various different data within the  
organizer by eliminating or correcting such data  
15 or entering new data.

U.S. Patent No. 5,621,658 to Brion K.

Jackson describes an action contained within an electronic mail object which is communicated from a data processing system to another data processing system via an audio device. The action is executable on a data processing system. At the sending data processing system, the action is converted to a predetermined audio pattern. The electronic mail object may contain text in addition to an action. The text is also converted to an audio pattern. The audio patterns are then communicated to the audio device over telephone lines or other communication medium. At the receiving end, the audio device records the object. A user can provide the recorded object to a data processing system, which then executes the action and

converts the text audio patterns back to text.

In addition, the action can be converted to text and displayed on the data processing system.

U.S. Patent No. 5,631,745 to John J. Wong et

5

al. describes a telephone terminal adapted for business or home use that includes the ability to

receive and send facsimiles, a voice answering

function and a computer modem. Various input and

output devices may be used for the facsimile

10

function. A voice annotated facsimile may be

sent and received. At the same time the

facsimile is viewed on a video monitor or

ordinary television set, an accompanying voice

message is heard through the sound system of the

15

monitor or television set. The terminal has an

architecture including a central processor and an

internal bus structure to which several types of  
memory, various input-output devices and an  
interface with the telephone line are connected,  
among others. Audio Random Access Memory (ARAM)  
5 is used for storing both facsimile data and voice  
data.

U.S. Patent No. 5,671,328 to Gregory P.

Fitzpatrick et al. describes a method and data  
processing system which are disclosed for  
10 automatically creating voice processing template  
entries. In one embodiment, the invention  
automatically assembles a plurality of commands  
received by the data processing system, at least  
one of said commands having a voice recognition  
15 criteria component associated therewith, counts  
the occurrences of the plurality of commands,

assembles voice recognition criteria components  
associated with the plurality of commands, and,  
as a result of the occurrence count exceeding a  
predefined minimum, constructs a voice  
5 recognition template entry by associating the  
assembled voice recognition criteria components  
with the assembled plurality of commands.

U.S. Patent No. 5,850,627 to Joel M. Gould  
et al. describes a word recognition system which  
10 can: respond to the input of a character string  
from a user by limiting the words it will  
recognize to words having a related, but not  
necessarily the same, string; score signals  
generated after a user has been prompted to  
15 generate a given word against words other than  
the prompted word to determine if the signal



should be used to train the prompted word; vary  
the number of signals a user is prompted to  
generate to train a given word as a function of  
how well the training signals score against each  
5 other or prior models for the prompted word;  
create a new acoustic model of a phrase by  
concatenating prior acoustic models of the words  
in the phrase; obtain information from another  
program running on the same computer, such as its  
10 commands or the context of text being entered  
into it, and use that information to vary which  
words it can recognize; determine which program  
unit, such as an application program or dialog  
box, currently has input focus on its computer  
15 and create a vocabulary state associated with  
that program unit into which vocabulary words

which will be made active when that program group  
has the focus can be put; detect the available  
computational resources and alter the  
instructions it executes in response; test if its  
5 ability to respond to voice input has been shut  
off without user confirmation, and, if so, turn  
that ability back on and prompt the user to  
confirm if that ability is to be turned off;  
store both a first and a second set of models for  
10 individual vocabulary words and enable a user to  
selectively cause the recognizer to disregard the  
second set of models for a selected word; and/or  
score a signal representing a given word against  
models for that word from different word model  
15 sets to select which model should be used for  
future recognition.

Notwithstanding the prior art, the present invention is neither taught nor rendered obvious thereby.

SUMMARY OF THE INVENTION

5           The present invention is directed to a method of creating data for directories for locating items so that the directories are efficiently loaded with location data both prior to use by the customers or other users, as well  
10           as, in some preferred embodiments, so that the directories may be updated as desired while in use. This method involves utilization of bar codes to determine item identity, and the use of separate bar codes to determine locations. These  
15           separate location-identifying bar codes are physically located on location structure, e. g.

on aisle ends, shelf edges, bin walls, parking spaces, etc. This location data is read in conjunction with item identification data by bar code readers, fed to a processor in a

5       recognizable combined format, and then stored and used as the resource data of the directory and/or becomes the directory itself. One the

item/corresponding location data is created, it may be used to print out or publish directories, it may become available by wireless service, by 10       internet, or be screen presentable or retrievable, as in the case of keyboard/monitor type directories, or any combination of the foregoing.

15       For example, a supermarket could assign unique bar codes to each aisle, create bar code

labels and attach them to the ends of each aisle,  
and then program the system according to the  
following simple process:

5           a) The processor will be programmed to read  
and identify products by the universal price code  
("UPC") inputs from a bar code reader, and will  
likewise be programmed to recognize and identify  
locations by bar code inputs from a bar code  
reader, that is, the processor will be programmed  
10       to understand the codes created for particular  
locations to be included in the supermarket  
product location system;

          b) The processor will also be programmed to  
match items (products) to locations when read  
15       between identical location readings. In other  
words, when a reader inputs a location bar code

from one end of an aisle, and then reads all of  
the UPCs of all items in the aisle, and then  
reads the same location bar code at the other end  
of the same aisle, this tells the processor to  
5 create a matching set of pairs of products and  
locations for all products read between each end  
of that aisle. In an alternative embodiment, each  
type of item could be read before or after the  
location reading to create location data  
10 pairings. The created, stored data may then be  
used for the directory or directories in any  
desirable manner and form, including those  
described above.

A locator system having these directories  
15 may be a stand alone device, but in many  
embodiments would be part of an internal

connected system. It could be an intranet or  
secured internet system, but would in many cases  
be a storewide system with a plurality of user  
locations (units, phones, or microphones, with  
5 feedback at each location). The system could  
merely be a set of print outs at various  
locations around the store or other facility, or  
could be one or more keyboard/monitor sets where  
a customer would type in the desired item  
10 (product), or the system could be more  
significant and include voice activation and/or  
voice recognition and/or voice response. These  
more sophisticated systems could include an  
embedded voice-driven interface for speech  
15 control of: (1) operational instructions; (2)  
core system locator function operations, that is,

recognition of specific requests and responses thereto; and, (3) optional and default functions.

Thus, the system utilizing the present invention

method could include a device which is both

5 operated by speech (speech or voice activated)

and speech responsive (voice answers and

instructions to the user from the system). Thus,

the system may rely upon automatic speech

recognition (ASR), either in place of or in

10 addition to manual locator systems, e.g. book,

list, map and computer directories.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention should be more fully understood when the specification herein is taken

15 in conjunction with the drawings appended hereto

wherein:



Figure 1 illustrates a block diagram showing the system and method of creating a directory in accordance with the present invention; and,

Figures 2a and 2b show a general schematic diagram showing software and functional features of a present invention method and its incorporation into a voice-based item locator system, including the present invention method of creating item /location data pairs.

#### DETAILED DESCRIPTION OF THE PRESENT INVENTION

The present invention is a method and system for creating data for item location directories. By "item" is meant a place or thing that a user desires to locate. Thus, a item could be a particular brand of canned string beans, a type of outdoor stain, a booth at a convention, a

particular part in inventory for sale, assemblage  
or distribution, a particular automobile in a  
production facility lot or in a large parking  
garage, or a room, a functional group or a  
5 person's desk in an office building or the like.

The "location" may be in the form of a word or  
sentence presented visually or audibly and/or it  
may designate an aisle, a shelf, a bin number, a  
room number, a row and slot or space, etc.

10

An important aspect of the present invention  
is the system of software and hardware  
(equipment) to utilize the present invention  
method of creating item location information for  
directories. It involves using item-identifying  
15 bar codes on items to be included and using  
location-identifying bar codes from corresponding

locations. The location-identifying bar codes are physically situated on the locations themselves.

For example, they are located on aisle ends, shelves, bins, drawers, floor area grids, etc.

5

The location-identifying bar codes may be custom created for the locations or may be established as a universal location system.

10

Alternatively, a manager could use existing UPC bar codes for the locations, provided that they were different from the items to be located, and provided that the system were programmed to correlate these particular codes to specified locations.

15

The item-identifying bar codes are typically located on the items themselves, but when more than one identical item is included, a single

item of the set of identical items will be  
sufficient for the method to work. However, it is  
preferred that all items in each set have the bar  
code located thereon. In some preferred  
5       embodiments, the bar codes for the items are  
Universal Price Code (UPC) bar codes, but the  
present invention need not be limited thereto,  
such as when it would be more appropriate to  
create unique identifying codes for each and  
10       every item, such as automobiles, artwork, etc.

The essential features of the present  
invention system include the item-identifying bar  
codes, the location-identifying bar codes, the  
items and their locations, at least one bar code  
15       reader and at least one processor.

Figure 1 illustrates the present invention

in block diagram, showing a preferred embodiment of the method and system of creating a directory.

In this embodiment, a plurality of identical

items comprise a set, and there are a plurality

5 of such sets. Thus, there are a number of sets of

items at a specific location, and a plurality of

such locations. This model could be a department

store, a grocery store, a hardware store, etc. As

shown in the Figure, there are three different

10 locations and each has three different sets of

items. Location First 3 has Items A, B and C;

Location Second 5 has Items D, E and F; Location

Third 7 has Items G, H and I. Location First has

its own unique identifying bar code 9; Location

15 second has its own unique identifying bar code 11

and Location Third has its own unique identifying

bar code 13. Likewise, Items A through I each have their own unique product identifying bar codes, and, in this case, Universal Price Codes (UPCs). Representative is Item A shown as item 15

5           with its own UPC 17. Bar code reader 19 is used to read the location bar codes and product bar codes in a manner consistent with a program-required sequence ( i.e. the sequence must conform to what the software has been programmed to expect, such as, first reading is product, 10           second reading is corresponding location). The readings are processed to convert optical readings to digital and the digital data may be used to create hard copy, such as directory 23 15           shown, or screen presentation, or audio, or voice activated, or combinations of offerings for

directory access.

Figures 2a and 2b show a general schematic diagram of a present invention method and its integration into a voice-based directory system, showing general software features and functional features. Thus, the present invention includes a method, and a system with the software and hardware for the creation of item/location data pairs, as described above.

In Figure 2a, the basic aspects of the item/location information data creation method are set forth in schematic form. The unique item-identifying bar codes are attached to at least one of each different item for a plurality of sets of items, each set having items different from the items in the other sets. Likewise,

unique location-identifying bar codes are  
attached 14 to the corresponding locations, and,  
subsequently, they are read 16 in predetermined  
manner so that the program recognizes sequences  
and creates data pairs to develop the  
item/location vocabulary for the system. This  
information is included in manager inputs 10  
(referenced also in Figure 2b as inputs 13). The  
method shown in Figure 2a is repeated as needed  
for updating 18.

Figure 2b illustrates features of the  
overall item locator system in which the present  
invention system and method are used, and  
includes a central processor 11 which may be an  
external or internal component, i.e., within a  
single unit or at a separate location from audio



receivers and transmitters , e.g.,  
microphones/speakers for user inputs and feedback  
to users.

5           The system may be preprogrammed with the  
user being required to follow concise  
instructions for activation and operation, or may  
be programmable to alter, add or enhance ease or  
methods of use, e.g. through a limited access  
code, for manager inputs 13 of user instructions.  
10          In any event, manager inputs 13 shall include  
functional selections and inputs of items and  
their locations, with provision for subsequent  
access for modifications. This programming may  
include direct keyboard, voice, etc., and, as  
15          mentioned, may include security capabilities for  
preventing unauthorized use, e.g. voice

identification (user recognition) or user security code system, as well as other options which may be included therein, such as a "help" detailed manager instruction section.

5

Once the system has been programmed for use, the user operation unit(s) 15 provide functional access, which may be passive, i.e., the user speaks, picks up a phone, presses a button, or otherwise takes some action to activate the system; or it may be active, i.e., a proximity sensor, a periodicity timer, or other internal mechanism may automatically activate the system and could trigger an audio or visual query, such as "May I help you locate a product?"

10

15

Once the system has been activated and a user has stated the necessary words of input to

activate the device, recognition/non-recognition  
response 17 results from processing the user  
inputs to central processor 11, and audio and/or  
video response unit(s) 19 provide feedback 21 to  
5 the user, either by answering the inquiry,  
conditionally defaulting, e.g., asking for a  
repeat or a restate the question, or fully  
defaulting, e.g. directing the user to a courtesy  
desk or check out counter for additional  
10 assistance.

Obviously, numerous modifications and  
variations of the present invention are possible  
in light of the above teachings. It is therefore  
understood that within the scope of the appended  
15 claims, the invention may be practiced otherwise  
than as specifically described herein.